Scientific American.

THE ADVOCATE OF INDUSTRY AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

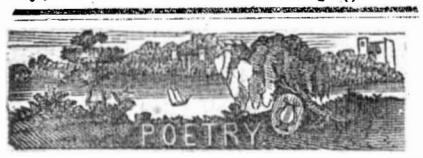
VOL. 2. NEW YORK, DECEMBER 26, 1846. NO. 14.

THE NEW YORK
SCIENTIFIC AMERICAN:
PUBLISHED WEEKLY.
At 128 *Fulton Street, (Sun Building,)*
NEW YORK.
BY MUNN & COMPANY.

RUFUS PORTER, EDITOR.

TERMS.—$2 a year—$1 in advance, and the remainder in 6 months.

☞ *See Advertisement on last page.*



PITY THE POOR.

The winter-times are coming fast,
Pipes loud and shrill the autumn blast,
And leafless limbs are quivering,
And houseless ones are shivering :
With your eye
You may spy
Naked feet
'Mid the sleet !
Then pity, oh ! pity the poor,
Who stand in the cold at your door.

When your hearth-fire blazeth brightly,
Even as it burneth nightly :
When you hear the wild winds chilly
Pipe their warnings loud and shrilly ;
In the storm
See the form
Thin and pale ;
Hear the wail
Of the suffering—list the cry,
"Help the poor ! Help them or they die !"

Clothed in rags so thin and scanty,
Live they in some cheerless shanty—
Doors unhung and windows open,
Roof all leaky, walls all broken :
There half dead
Without bread.
Hear the cry—
"Must we die ?
Perish we in this great city,
None to save and none to pity ?"

'Mid the snow, and 'mid the hailing,
Christians, hear the orphan's wailing !
Ye are blessed with Heaven's plenty,
While their fare is poor and scanty.
Loud the blast
Whistles past ;
At your door
Stand the poor
There are many in this city,
Few to aid and few to pity !

WHO ARE THE POOR.

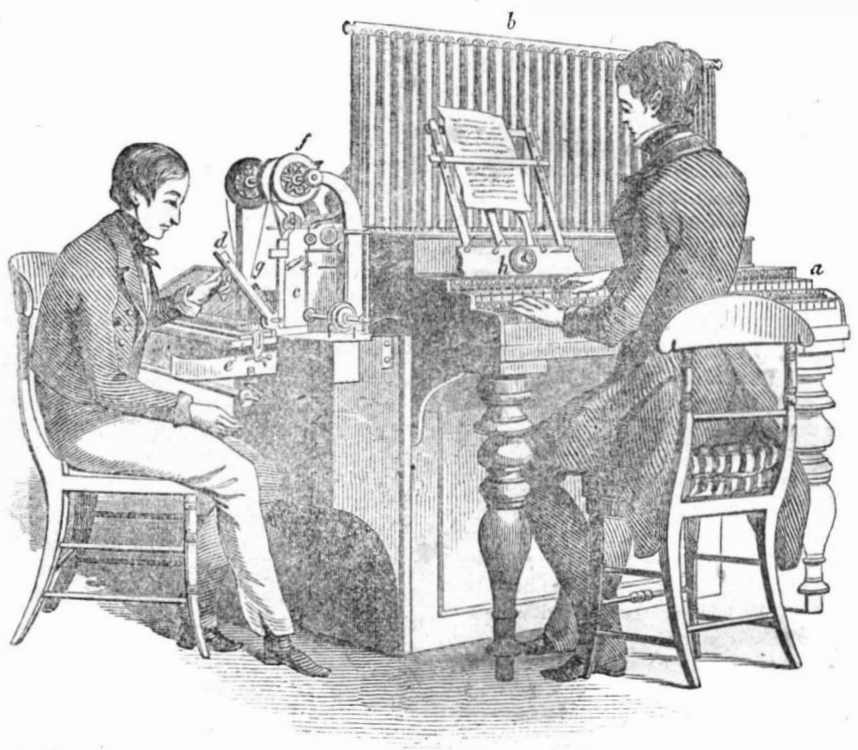
The poor ! The poor are everywhere ;
They dwell in huts, on stinted fare ;
They dwell in halls of marble rare,
And eat from gold ;
Or in the counting-house of care
They rust and mould.

They who life's labor never touch,
But at its table take too much,
Feel Poverty's severest clutch,
As I opine,
The work-house were a bliss to such
Poor soulless swine.

The want of bread is sore indeed ;
Worse is the want of mouths to feed ;
Yet would I bow, were these decreed
To be my trial,
Might I but not be poor for need
Of self-denial.

The thoughtful brow, or horny hand,
Which, fighting under self command,
Keeps hunger only at a stand
From day to day,
Is wealth, for which no cash or land
Could ever pay.

MESSRS. CLAY & ROSENBORG'S PATENT TYPE SETTING MACHINE.



That our readers may be assured of the actual existence and operation of such an instrument, we would here state that all the types used in this description, were set by the above process. The machine is expressly adapted to all kinds of plain composition, poetry or prose; the power is applied by means of a revolving crank and may be driven by steam power, being in effect, a *steam type setting machine !*

The type setting machine is in the form of a cottage piano-forte, but, instead of one row of keys it has two. Each of these keys are connected, by the aid of levers, to small brass pushers, each pusher being of the same thickness as its respective type ; the type after being distributed is set up by boys, it is then deposited longitudinally into a series of brass channels, or as they are termed 'uprights' (*b*). Two or three hundred letters can be inserted into the machine at once, by means of a small iron rod with a thumb screw and slide attached to it :—it is termed a "feeding-stick." An endless chain is constantly running when the machine is in operation, from one end of the machine to the other, that is from right to left ; it runs between the two brass columns, on a cast iron plate. On each side of the chain is a plate whereon the brass columns are fixed and the type deposited : the pushers also rest on this plate. As soon as a key is depressed it acts upon the pusher and forces one type out of the column on to the endless chain when it is conveyed as quick as thought to the receiver (*c*) where it is deposited on a T shaped slider. The dial (*h*) in front of the compositor indicates when each line is completed ; when the line is full the compositor turns a small winch,—seen in front of the receiver (*c*)—by which means he lowers the line ; then with his right hand moves a lever and pushes the line into what is termed a "justifying-stick" (*g*) when the assistant lowers it down, corrects it and then it is deposited into the galley, (*e*) line after line. As soon as the galley is full it is then given to another person to "make up" or impose, and another galley is substituted, so that no time may be lost whilst the other galley is being emptied. Each machine will admit of two different sizes of type, and will set any measure from twelve to thirty three ems pica. The keys (*a*) are not arranged alphabetically, but systematically, so that three, four, or five, or more letters may be set up by one pressure of the fingers. To work one of these machines it requires five persons, one man and four boys, and when the machine is in full operation, will set up as much as eight compositors. It would be impossible to give a more descriptive account of this ingenious and practicable invention.— All Master Printers, Publishers and Editors are therefore earnestly and respectfully invited to inspect the machine at their earliest opportunity. The machine is to be seen in operation on Tuesdays and Fridays, from 10 to 12 in the morning and from 2 to 4 in the afternoon, at 91 John St. corner of Gold.

We understand that the proprietors of the *New York Sun*, with their accustomed enterprise, are about introducing these wonderful instruments into their establishment. They are in extensive use in London.

More Fireworks.

Mr. Brown of Illinois, has now at Washington a fire ship or fort for harbor or land defence. It reflects off the enemy's shot, and envelopes ships or armies in a flame of inextinguishable fire.

Marriage is, at all times, a perilous experiment, but Foot defines it as bobbing for a single eel in a barrel of snakes ! Shocking.

A LIST OF PATENTS

Issued from the 12th of December to the 19th of December, 1846, inclusive.

To Samuel Winnott, of Littletown, Pa., for improvement in Cooking Stoves. Patented 15th Dec. 1846.

To Edwin D. Wilson, of Phillipa, Virginia, for improvement in Washing Machines. Patented Dec. 15, 1846.

To Hiram F, Wheeler, of Springville, Pa., for improvement in Spinning Wheels. Patented Dec. 15, 1846.

To Edward D. Tippett, of Georgetown, D. C., for improvement in Washing Machines Patented Dec. 17, 1846.

To William Beal, jr., of Norway, Maine, and Bernice S. Hale, of Lowell, Mass., for improvement in Mills for Cracking and Grinding. Patented Dec. 17, 1846.

To Fowler M. Ray, of New York, for improvement in Car Wheels. Patented Dec. 17, 1846.

To William H. Robertson, of New London, Conn., for improvement in Mattresses. Patented Jan. 2, 1846.

To Sewall Folsom, of Bridgeport, Conn., for improvement in Ladies Skirts. Patented Dec. 17, 1846.

Sagesms, Selected.

Kindness in the heart is a gem of the first magnitude. Whoever possesses this trait, will sail smoothly over the ocean of life, leaving behind a memory that will never cease to be cherished.

Five of the sweetest words in the language begin with H, which is only a *breath* ; Heart, Hope, Home, Happiness and Heaven. He rt is a hope place, and home is a heart-place ;—and that man sadly mistakes, who would exchange the happiness of home for anything less than Heaven.

Let secret prayer by yourself alone be constantly performed before the labor of the day be undertaken. It is much better to go from prayer to business, than from business to prayer, in regard to the mind's freedom from distracting thoughts. Because also, if the world gets the start of religion in the morning 'tis hard for religion to overtake the world the day after.—*Burkitt.*

The habit of listless inactivity of mind should be carefully guarded against by the young, and the utmost care should be taken to cultivate the opposite, namely, the habit of directing the mind intensely to whatever comes before it, either in reading or observation.—This may be considered as forming the foundation of sound intellectual character.

"Since I have known God in a saving manner," said a lady, "painting, poetry and music, have had charms unknown to me before. I have received what I suppose is a taste for them ; for religion has refined my mind, and made me susceptible of impressions from the sublime and beautiful."

Many of the reasons passing current in the world, as good coin, are as decidedly *bogus* as the excuse Charles Lamb made for being late at his post as one of the clerks in the East India House. "You have been tardy for several mornings, Mr. Lamb," said one of the directors. "Yes," he quietly replied ; "but then, sir, *I always go away very early in the afternoon.*"

Magnetic Telegraph.

The Hon. Amos Kendall contends that the first act of Congress, after assembling, ought to be the passage of an act appropriating the necessary funds to secure to the government, the use of the telegraph from Washington to New-Orleans during the progress of the war. He says that by a vigorous effort it can be placed in operation, on the whole route in four months.

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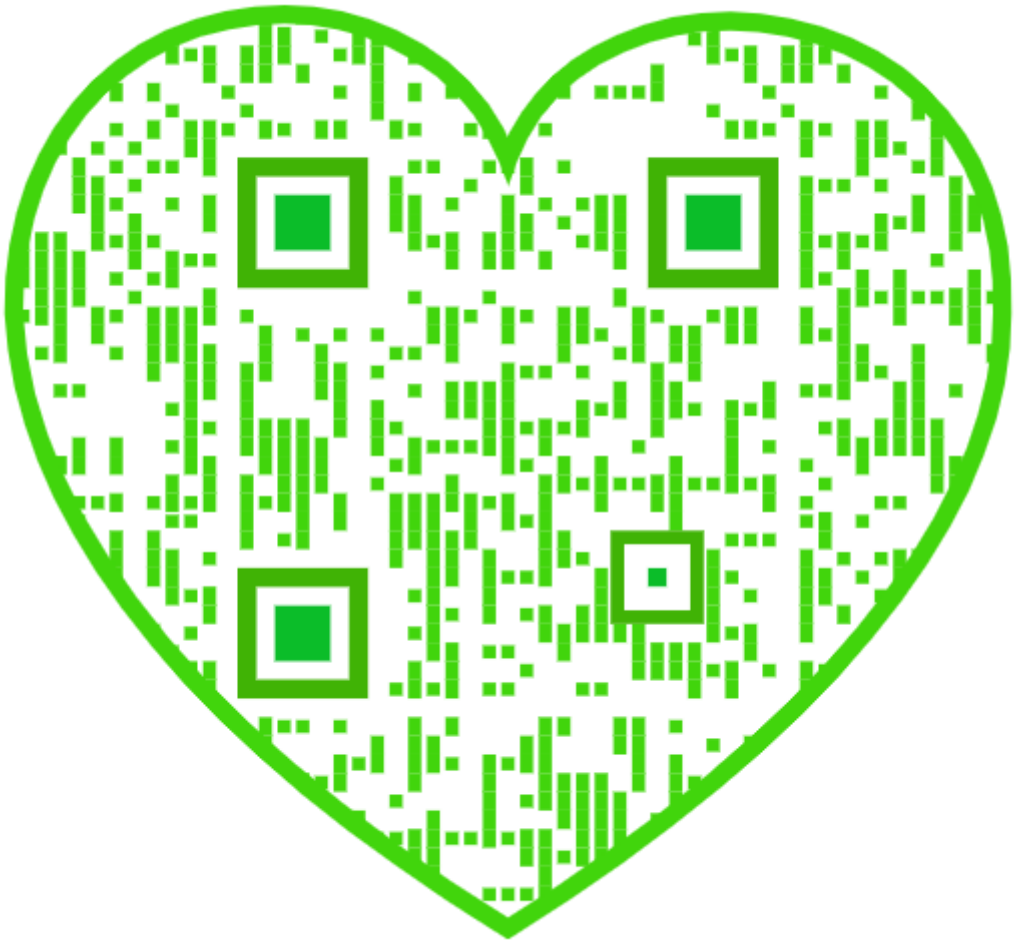

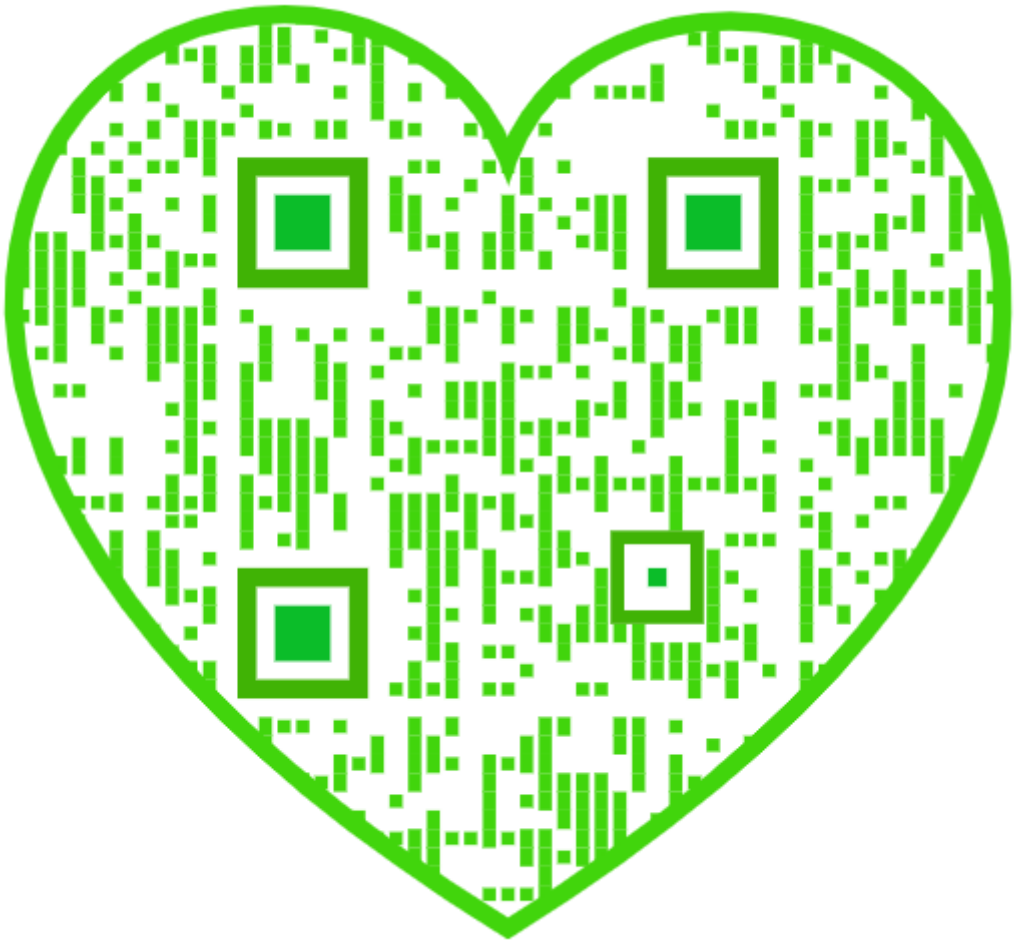

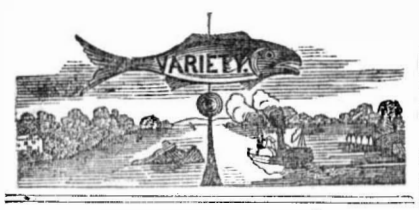

Recent Fires.

Of the many destructive fires which have been reported within the last two weeks are one at Windsor Locks, Ct., by which Holliston's Paper Mill, with machinery and stock on hand was destroyed. At Chicago, Ill., a large warehouse and four or five dwelling houses.—At Bath, Me., the dwelling house of Cap Richard Curtis; also the steam mill of J. & J. Robinson, by another fire. At Quincy, Mass., a grist mill belonging to Mr. Henry Souther.—At Hadley, Mass., a large barn owned by Mr. Chester Gayloid, two horses, 20 head of cattle, and a number of sheep. At Providence, R. I., a dwelling house owned by Mr. Kingon, At Fall River the dwelling house owned by Mr. Andrew Robeson. At Trenton, N. J., Bird & Wild's axe factory and the mills owned by Sager & Bristow.

That Turkey.

On the evening before Thanksgiving Day, a Cincinnati auction merchant of unimpeachable standing sat in the parlor, chatting with his wife He had been promised a fine, fat turkey for the dinner next day, and was awaiting its arrival. The door bell at length rang, and the gentleman ran down to the street door, picked up a basket, and returned to his wife, saying; "Here, dear, is the turkey, basket and all." The lady made preparations for the disposition of the turkey for the night, and raised the covering when to her astonishing eyes appeared an interesting infant. Before fainting she had only time to say, "Dear, if you call that a fat turkey, you can cook it for yourself—I have no relish for such things."

Wet Feet.

The Philadelphia Enquirer says "wet feet *is one* of the most effective agents Death has in the field, and has peopled more graves than all the engines of war." Now we dont believe a word of that: whether wet feet is *one* or two, we have known old hale and healthy men who have been accustomed to have their feet wet nearly every day in winter, and seldom wore boots or shoes in summer; and we have often observed that those delicate ones who carefully avoid the least dampness to their feet are most frequently complaining of colds.—The article in the Enquirer was probably written by some dealer in India rubber shoes.

Racing with a Shower.

"The other day," says Neverbeat, "I was up to S——, sixteen miles distant. Just as I started for home, a shower came sweeping on. The rain struck in the back part of the wagon, and the moment it struck, I hit *Kate* a cut with the whip and away she trotted, scarcely touching her feet to the ground. She kept just nip and nip with the shower. The wagon was filled with water, but not a drop fell on me. Old Kate can't be beat, When she goes, she goes it."

The Holy Land.

A society has lately been formed in England entitled "The British and Foreign Society for promoting the colonization of the Holy Land." It is stated that "there is a growing, and now very general desire among the Jews to return thither, and that in many parts of the world there are large classes of Jews who are purely agriculturalists, and therefore just the people to flourish there; that whereas some years ago there were but about 2000 Jews resident in Palestine, there are now about 40,000."

A Baked Mail.

The mails received in Indianapolis, in the early part of December, were in such a snturated condition that the postmaster was obliged to resort to the expedient of baking the letters and papers in a baker's oven. That may be the reason why so many of our political exchanges are so *crusty*.

Big Beef.

Mr. Hiram Crosby, of Attica, N. Y. has sold an ox to a Mr. Clark of Toronto, for $250.—The weight of the ox is 3000 lbs.

Circassia.

Recent intelligence from Circassia is of thrilling interest. The struggle of Russia for this country bids fair to be one of the most memorable in the annals of history. At first it was confined to the natives of Caucasus.—Now it is supposed there are five thousand Poles and 20,000 Russian deserters in league with the Circassians. The latter have placed themselves under a skillful Russian deserter, Baki Dellisen, and have made successful forages into the Russian Territories, which so encouraged several native tribes, who had formerly submitted, that they revolted, abandoned their territories and fled to the mountains. An important battle has recently been fought in which the Russians lost 800 men killed and 300 hundred prisoners, with several pieces of artillery.

Ship destroyed by Lightning.

The ship *Thomas P. Cope* from Philadelphia for Liverpool, was struck by lightning on the 29th of November, which not only set the masts, sails and rigging on fire, but ignited a quantity of cotton in the hold The mainmast was cut away, and every exertion made to extinguish the fire, but in vain. The crew were taken off by the ship Washington Irving, soon after which a sudden burst of flame, like an explosion, was seen on board the deserted ship and she soon disappeared.

Mixed Apples.

The Rochester Republican mentions having recently seen several apples, a part of which is yellow and sweet, while other parts are white and sour. These apples were brought from Massachusetts, and are said to have been produced by budding the tree with parts of different buds united. Buds are taken from different trees, aad each bud is split lengthwise and the half of each of two different buds joined and inserted together by the usual process.

"Shan't do any thing else."

A good clergyman who is averse to the folly of extreme fashion, calling one day on a fair parishioness found her engaged in making a large *bishop*. Observing how she was employed, he remarked, "I hope, madam, you are not going to wear that article to church."

"*Shan't wear any thing else*," was the independent reply.

Bears.

North Mississippi is said to be overrun by these "varmints" of the wilderness. The people of Hernando and Panola are having the tallest kind of sport, and are slaying them daily in the immediate vicinity of their towns.—Thousands of them, it is said, are making their way from the Mississippi bottoms to the hills, probably in search of food.

A Quick idea.

"Please to give me a penny," said a ragged, bright-eyed little girl, to a well-known member of the Press.

"I have not seen a penny for a week, my little girl," was the reply.

"Then, perhaps. sir, you have seen a sixpence?"

He gave her a shilling, of course.

Too Much Truth.

The bo-hoys in London amuse themselves by singing Yankee Doodle to the following humorous stanza:

"Yankee Doodle borrows cash,
Yankee Doodle spends it;
And then he snaps his fingers at
The jolly flat who lends it."

Wiskonsan.

Some of the Western papers are correcting each other on the orthography of this word.—It appears that it had been decided by Congress that it should be spelt as above; but the inhabitants, editors, and judiciary persist in writing it "Wisconsin." They will of course prevail

Prices Current in Ohio.

Flour, retail, at mills $3,75; Wheat at mills 56c; Corn 20c; Rye 35c; Dried Apples 37 to 50c; Dried Peaches $1,50; Butter 10c; Potatoes 25c; Beef 2 1-4c; Tallow, 6c; Hay $5 per ton.

An Elevated Country.

It has been ascertained by Lt. Emery that the altitude of Santa Fe is 6000 feet above St. Louis Mo.—nearly 7000 feet above the level of the sea.

Niagara Suspension Bridge.

It is now confidently asserted that Queen Victoria has consented to have Canada united to the American States by a bridge over the Niagara. The construction of the bridge, will, of course, be forwarded with alacrity by the inhabitants on both sides of the river.

Extension of the Telegraph.

A card appears in the Philadelphia journals over the signature of Henry O'Reilly, in which it is stated that the Atlantic Lake and Mississippi Telegraph will be in successful operation as far as the Ohio river by the first of January next.

Cheap Enough.

We have seen a warm and substantial overcoat of full size, the cloth for which—the entire pattern—cost only $1,25 at Lee's dry good store 245 Greenwich steeet. Our economical readers may find some excellent bargains at that shop.

Gun Cotton for Blasting.

The gun cotton has been brought into use at Lowell, Mass., for blasting rocks. The mass moved by one explosion was 1125 cubic feet. Ten ounces of cotton were equal to ten pounds of gun powder.

The Sound Steamers.

Since the loss of the Atlantic the proprietors of the Worcester and Cleopatra, have furnished those vessels with masts and sails. It is evidently an important improvement.

Mr. Bogardus' Inventions.

We are requested to defer for the present, the continuation of the notices of these valuable inventions, in consideration of certain *new* improvements, which it is desirable to introduce in connection, but which are not yet perfected.

Energetic.

The Selectmen of Easport, Me. have offered a reward of five dollars to any person who will furnish them with evidence, upon which any Rumseller can be convicted.

The average weight of the mails that leave New York in one week according to the Post Master General's report is over sixty thousand pounds.

Stewart Forbes of Albany, has been sent to the State Prison for four years and six months for robbing a family of German emigrants.

Mr. Emile Dichary of St. James, La., wa killed on the 25th ult. by two slaves. He attempted to shoot them but his gun missed.

The publication of the "Boston Sun," has been supended, or as some say the *sun has set*. We hope the Bostonians are not dependent on *Star* light.

A man in Worcester, Mass., has been sentenced to be hung, for setting fire to a dwelling house. This punishment will probably be commuted.

A Richmond paper states that Gen. Taylor writes as well as he fights, and every dispatch signed with his name, is written with his own hand.

The Capitol of Iowa is built of marble, at a cost already of $80,000, and it is said it will cost $20,000 more to finish it.

The annual crop of hay raised in this country is represented to be 15,000,000 tons, which at $8 per ton is $120,000,000; a large amount for a single article.

Commodore John Frost has blockaded all the ports on the Hudson from Newburgh to the head of navigation.

It is ascertained that the late hurricane in Havana destroyed 1275 houses, and injured 1038 more. Most of the crops and very many cattle were destroyed.

A gentleman who lately travelled a considerable distance to visit the ruins of Pompeii, expressed much dissatisfaction at finding them so much *out of repair*.

Five hundred and eighty-two wagons were ferried over the Mississippi, at Burlington, Iowa, in two weeks, most of them containing emigrants

It is stated that Gen. Scott, to facilitate his operations, took with him to New-Orleans half a million of dollars.

For the Scientific American.

Mr. Porter.

I see by your paper of last, week you enquire, *What has become of Dr Clowes?* To this enquiry, I answer *here*, at 138 Canal street in the city of New-York.

My object in establishing myself here is, to teach, if I can obtain pupils, a *school* for the classical, mathematical, or English studies. I desire particularly to have for my pupils, those who are, or those who wish to be teachers. I refer you to my advertisement, from which you may make such extracts as you see proper.

In relation to *Tachymathy*—or, as the word means "Things worth remembering, and the best means of remembering them." I intend to teach that, if I can obtain an audience, in Lectures to be delivered on Tuesday 29th, & Thursday 31st Dec., and on Friday 1st, and Saturday the 2d of Jan.; and on the Monday, Tuesday, Thursday and Saturday of the following week; each lecture to commence at 7 P. M. The price of admission to each lecture is for adults 12 1-2 cents; children half price.

I invite you to attend these lectures free; or rather as some slight compensation for inserting this communication; and oou are desired to gain all the information you can from my lectures, in order to communicate it to your readers.

I cannot consent to be very communicative in writing out my processes for publication in your paper; as by so doing, I might prevent myself from obtaining a copy right for a work on *Tachymathy*, to be published as soon as the public favor may enable me to put it to press. I have already suffered by my two ready consent to publish some of my arithmetical processes.

I did design when I sat down to write, to give you several arithmetical problems with their solutions. But the space I wish to occupy or which you can spare, permits me only to set down a dozen problems, out of many thousands, which I will solve in my first lecture.

Problem I. Write down from memory the number of inhabitants in each of the middle states, according to the census of 1840.

Problem II. Find, by a single operation in addition [substraction being excluded] how many inhabitants there are in the four middle more than in the six N. E. states.

Problem III. Exhibit a formula to show at sight what day of the week, the first day in each month in 1847 will fall upon.

Problem IV. Exhibit a similar formula to show what day of the month the first Sunday in each month in 1847 will fall upon.

Problem V. Extend these last two formulas, into a formula to be used for the purpose of a perpetual almanck to serve from the correction of the calendar by Julius Cæsar, 46 B. C., to the end of Time.

Problem VI. Exhibit the square of 999999, and give a formula for showing by instaneous operation the square of any sum, consisting of any number of nines.

Problem VII. Exhibit by rapid process in multiplication, the decimal of 1-89 extended to forty four places.

Problem VIII. Perform the same by division.

Problem IX. " " substraction.

Problem X. " " addition,

Problem XI. Give the date of the accession of the sovereigns of England from the conquest to the present time.

Problem XII. Give the date of several of the most prominent events mentioned in Sacred History.

Persons who attend my lectures will be enabled to solve these problems, and a great many more, with the same readiness that I can. Very respectfully, yours,

No. 183 Canal st. T. CLOWES.

TO CORRESPONDENTS.

We regret to be compelled to say that on account of an unusal press of business we must defer answers to our numerous correspondents among whom are E. B. of J.—A. S. M. of W.—C. C. C. S. of N. B.—A. Y. of M.—M. K. of W.—A. C. of B.—D. T. of N.—W. B. of S. S.—G. G. of W.—and a Subscriber of H. They will please to be patient.

"E. B. of J."—We should be pleased to hear from you again—either prose or poetry acceptable.

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Friction.

The surface of all bodies when viewed through a good microscope, will be found to be full of inequalities, however smooth the surfaces may appear to the naked eye. Therefore, when two bodies are brought into contact the minute projections in one, fit into the minute cavities in the other; and consequently if the bodies are put in motion, their velocity will be much retarded from this circumstance, to which the term *friction* has been applied. The same effect takes place when two bodies are brought into close connection with each other, from their having a tendency to cohere together.

The influence of friction is so extensive not only in the mechanical operations that man can control, but also in all the operations of nature, that a person who should neglect it in his calculations, when endeavoring to ascertain the result of any given force, would be guilty of great negligence. It may appear impossible for any one at all acquainted with mechanical philosophy to do so; yet it is quite certain that not a few of those who have devoted their time to the discovery of a perpetual motion, never thought it necessary to calculate the result of friction; or, if they did, they underrated it exceedingly. It is, however, the most powerful antagonistic force in nature.—Not only does it stop the marble thrown from the hand of the schoolboy along the surface of the ground, but it acts as effectually in bringing to a state of rest, bodies put in motion by the most powerful forces in nature.

A few familiar examples will, perhaps, best illustrate the power of friction.

When a coach descends a hill, one of the wheels is fastened, or locked, as it is termed, by which the iron tire is made to rub against the road. The friction this causes retards the velocity of the coach, and makes it descend with but little more rapidity than that with which it would proceed on level ground.

Before an engagement, the sailors on board a man-of-war, place their hammocks against the sides of the deck, in order, as much as possible, to stop the progress of the cannon balls. One of them striking a hammock is brought to a state of rest by the friction produced in its passage through the bed.

If a billiard-ball is thrown upon the ice, it will proceed to a far greater distance than if bowled along the ground. The reason is, that in the latter case there is more friction to be overcome than in the former.

A carriage placed upon a railway can be moved with a very slight degree of force to what is required to put it in motion on a common road, where the friction between the wheels and the earth is much greater than it is on the railway. Although, as it will frequently be seen, there is a greater cohesive force in the latter case. When locomotive steam carriages were first proposed to be adopted in this country, it was thought that the friction between the wheels and the road would not be sufficient to enable the carriage to proceed. That, in fact, when the engine was put in motion, the wheels would merely revolve, without going forward. Accordingly, Mr. Gurney, who first proved the practicability of employing the steam carriage on common roads, wasted much labor and skill in the contrivance of levers and propellers, which acedon the ground in a manner somewhat resembling the feet of horses, in order to drive the carriage forward: while, if he had previously made the experiment, he would have found, as he subsequently did, that the friction between the road and the rim of the wheel, was quite sufficient, not merely to enable the carriage to proceed on level road, but actually to ascend hills, where the inclination increased one foot in nine.

The above are a few illustrations of the influence of friction. As it acts so powerfully in diminishing the effect of all kinds of force, mechanics have always paid considerable attention to the best means of diminishing it.—Rubbing surfaces, in all well constructed engines, are avoided as much as possible; and when this cannot be done, the parts are kept well lubricated with oil, or other uncteous matter, which facilitates the motion of one body upon another. It is also found, that if the substances which rub each other are of different kinds, the friction is considerably diminished. Ferguson, who made a variety of experiments to elucidate this point, found, that while the friction of polished steel, moving on brass was only equal to one-sixth part of the weight of the rubbing substance, the friction of two pieces of soft wood was equal to one third the weight. In the construction of carriages this circumstance is taken advantage of. The axles of the wheels are formed of steel, and the parts they rub against of brass. In watches, too, if the steel axles play on a diamond, the watch becomes far more valuable for the accuracy, as well as for the intrinsic value of the diamond. Friction-wheels are also frequently used in machinery, for the purpose of diminishing the effects of friction. They consist of wheels, on which the axis of another wheel revolves.

The quantity of friction is always proportional to the weight of the substance moving upon another, and not to the quantity of surface, as might at first be supposed. It has also been found that friction increases with an increase of velocity, although it is not proportional to the increased celerity with which a body moves.

It must not be supposed, because friction has a tendency to destroy motion, that it is, therefore prejudicial. Were there no friction all bodies on the surface of the earth would be clashing against one another; rivers would dash with unbounded velocity, and we should see little besides collision and motion. At present, whenever a body acquires a great velocity, it soon loses it by friction against the surface of the earth; the friction of water against the surfaces it runs over soon reduces the rapid torrent to a gentle stream; the fury of the tempest is lessened by the friction of the air on the face of the earth; and the violence of the ocean is subdued by the attrition of its own waters. Its offices in works of art are equally important. Our garments owe their strength to friction; and the strength of ropes, sails, and various other things, depend on the same cause; for they are made of short fibres, pressed together by twisting: and this pressure causes a sufficient degree of friction to prevent the fibres sliding one upon another. Without the friction, it would he impossible to make a rope of the fibres of hemp, or a sheet of the fibres of flax: neither could the short fibres of cotton have ever been made into such an infinite variety of forms as they have received from the hands of the ingenious workman. Wood has also been converted into a thousand textures for comfort or for luxury, and all these are constituted by fibres united by friction. In fine, if friction retards the motion of machines, and consumes a large quantity of moving power, we have a full compensation in the numerous and important benefits which it ensures to us. So it is with nearly every other operation of nature; the same cause which at one time may produce much temporary evil, at another time will be productive of permanent and extensive good.

The Blacksmith's Boy.

"Some years ago," says the Worcester Cataract, "we were travelling through the interior of Pennsylvania, we had occasion to stop for the night at a small town. During the evening we went into a store, and whilst there our attention was attracted by a little boy whose clothes were begrimed with soot and coal from working in a blacksmith's shop (for he was a blacksmith's apprentice;) He brought to a merchant a small hammer which he had made out of pieces of iron given him by his master. Said he "Sir, will you be so kind as to give me a spelling book for this hammer? 'I want to read, and I have not got the money to buy a book." The merchant was so pleased that he gave him the book, and allowed him to keep the hammer too."

If this boy does not become a governor, or a member of congress, it may be considered certain he will be an ornament to society, and may contribute largely to the benefit of the working classes, by the influence of his example.

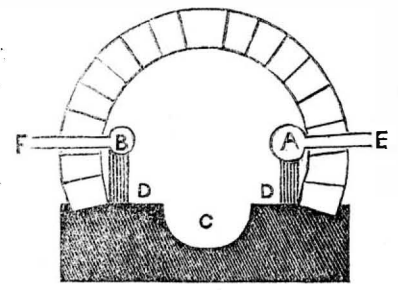
Profitable Prison.

The products of labor in the Ohio Penitentiary during the year ending on the 30th ult., were about forty four thousand dollars. The expenditures during the same period were $27,000—leaving a balance in favor of the Institution of $17,000,

WILLIAMSBURGH, Dec. 17, 1846.

To the editor of the Scientific American.

I wish to suggest through the medium of your paper, the propriety of making the main sewers in New York as per the annexed diagram.



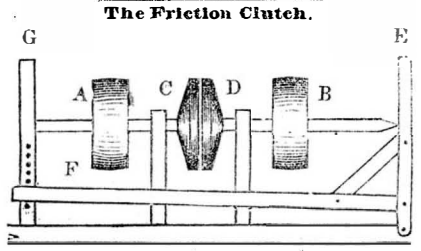
A. B. water and gas pipes; C, channel for water; D D, steps to walk on; E F, holes in arch for pipes to each house if required. The advantage of the above is, that the pavement need not be taken up in case of any of the pipes getting out of order—as any leakage can be stopped as soon as discovered.

Yours. H. A. S.

The plan above proposed cannot fail to meet the approbation of our citizens; but it will require a considerable time and influence to induce our city authorities to incur the expense of such an improvement. Our correspondent proposes to place occasional stone bars across the sewer to support the pipes: but we have omitted the representation thereof in the cut, and substituted stone posts, on account of the obstruction the former would occasion, to the passage of workmen in making repairs, &c.—It is evident that this plan contains some excellent peculiarities which render it worthy of a patent.

ED.

The Friction Clutch.



Our readers will understand that a *clutch* is an article of machinery attached to the ends of two meeting shafts or journals, whereby they are connected so that one may give motion to the other. But the most common mode of readily communicating motion to a shaft or mandrill, and suspending the same is by means of duplicate pulleys on the driven shaft, one of which is called the loose pulley and revolves freely on the shaft, while the other is attached to the shaft; so that the driving band is readily transferred to the loose pulley whenever the action of the shaft is to be suspended, without stopping the machinery. But the method here presented—by the use of the friction clutch,—is incomparably more convenient and readily appplied, either for connecting or disconnecting the driven part to the driver.

EXPLANATION.—Two pulleys A B are mounted on two separate shafts, and attached thereto, and at the end of each shaft, between the pulleys, is attached a half pulley or disk C D with a plane face so adjusted that the faces of the two disks may form a nice contact when pressed together. One or both of these disk faces may be covered with soft leather; but plane wood answers a good purpose. The opposite end of the shaft B has its bearing on the post E, which is connected to the base by a pivot: and from this post projects a horizontal lever F, extending to the side of the post G, to which a row of pins or ratchet teeth project; and the lever being constructed to take to these teeth, holds the lever down to any point to which it is depressed; and it will be readily seen that by the depression of the lever the disk D is pressed against the other. The pulley B is supposed to be kept in motion by a band, and the motion is instantly communicated to the other shaft by the contact of the disks. From the shaft A the motion may be carried by another band to a lathe or other machinery, or it may itself constitute the mandril of a lathe or circular saw. There are many different methods of connecting or detaching the disks which may be adopted as circumstances require; but in most cases it is preferable to connect the moving post or bearing to a treadle or foot lever, that the connections may be made by the operator without the application of the hands. Our readers will consider themselves free to use the friction clutch wherever it may suit their convenience.

Iron in Tennessee.

Mr. Editor:—In your paper of the 19th, you increased the currency to a paragraph that the first iron manufactured in Tennessee is that at the recently established Valley Works.—This is a mistake. The State of Tennessee is exceedingly rich in iron, coal and other minerals. To such an extent has iron been manufactured that it has sought a market, not only in the extreme parts of the Valley of the Mississippi, but to this city. The Dover Works have one million of dollars invested in the manufacture of iron. Zinc, copper, tin, and gold and silver, are found over the greater portion of the state. Tennessee and Western Virginia are destined to become to the Mississippi Valley, what Pennsylvania and New Jersey are to the Atlantic States. Middle Tennessee especially, is very rich in minerals, and the climate remarkably healthy, and admirably adapted to residents from this section of the States and from the most of Europe The table lands afford high promise for grazing farms, especially for raising hogs, the great variety and abundance of wild nuts affording them food. For the production of Corn Tennessee is the first State in the Union. S. F.

Religion is Love.

Religion is pure, and like its author, lovely and loving. It never lessens our attachment to another, chilling no affection, and drying up no springs of charity, and sympathy, and fine feeling that feed the river of the milk of human kindness in the breasts of men. The religion of Christ warms, but never chills us.—The bosom where it resides feels an influence and imparts one, too, which angels would recognize as kindred to what they inhale in their own Eden. Who can love the misanthrope, the poor curtailed animal once a man, but now less noble than the being stamped with divine features and born for social enjoyment.

While we exercise this principle, we cannot go astray. We shall stand in a broad place covered by the canopy of Jehovah, and instead of becomiag the slaves of superstition, or the tools of a party, we shall reverence true religion, find it where it will, in the palace or in the cottage, beaming from the face of an Indian, or shining from the face of an African.—Be a man of high or low degree, tugging at the oar, ar galled by the hand of slavery, religion is the same to all. As she goes forth clothed in the lovely regalia of her order, innumerable blessings attend her. The tears of the widow and the orphan are wiped away.—Over the turmoil of life she spreads her hands, stilling the rude surge of sorrow, and arching upon the mourner's eyes with the beautiful colors of peace, while around the world she scatters the bright ornaments of serenity and joy.—*Ex.*

Competition in Trade.

A funny atory is told of a Yankee soldier at Brazos Island, who finding water as well as cider and other liquors were becoming scarce had the speculative shrewdness to buy a barrel of cider and keep it till all the other cider was exhausted, when he set up a temporary shanty and put his barrel on tap at ten cents a glass. The cider was going off briskly, even at this price, till the barrel was nearly out when one of his customers demurred at paying ten cents on the plea that another dealer was selling [illegible] cents a glass. The Yankee averred that he was the only man who had any cider about the camp. But the customer was importunate and he was induced to go and taste. Whether there was another man so lucky as to have conducted to the rear of his tent, or that another speculator had set up a booth in front of the first shantee, and having tapped a barrel on the side of said solitary barrel, was doing a thriving business at five cents a glass.

Going with a Majority.

An Irishman being about to join a company in Lawrenceburgh, Ind., forming to go South, was questioned by one of the officers—

"Well, sir, when you get into battle, will you fight or run?"

"An' faith," replied, the Hibernian, I'll be after doing as the majority of ye does."

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NEW INVENTIONS.

The Type-setting Machine.

Some of our readers may remember that we have heretofore evinced some degree of scepticism on the subject of success in the construction of a machine of practical utility in the setting up of printer's type; but having witnessed the operation of Messrs. Clay & Rosenberg's machine, (represented on our first page) we are frank to admit that it approaches much nearer perfection than we had supposed practicable. We could not be expected to give a description which would enable our readers in general to clearly understand the construction and operation thereof, without a series of sectional drawings, longitudinal, transverse and vertical, of the several parts. We congratulate the inventor on his success, and trust he will be amply rewarded for his ingenuity and perseverance.

Steam Brick Press.

We have seen a variety of favorable notices and reccommendations of the steam-brick press, now in successful operation by Mr. T. H. Smith in Baltimore. The fact appears to be thoroughly established that bricks made by the machine are not only heavier and more perfectly finished, but about 25 per cent stronger than those made by the ordinary process.—The proprietor informs us that he had to encounter violent opposition from the brick-makers, who were not willing to have the improvement come into use at any rate. It is in vain for tradesmen or manufacturers to oppose the introduction of labor saving machinery in this country, and those who do oppose, usually injure themseves rather than the projectors.

Patent Steam Rivetting Machine.

Mr. James Garforth, of Dukinfield has obtained a patent for a machine for rivetting iron plates in the construction of boilers and other work. It consists of a cylinder and piston placed horizontally, the end of the piston forming the die, or hammer, and a substantial mass of iron presenting a small steel face to the rivet, the anvil. The valves are worked by hand to admit the steam on each side of the piston, as required; and the operation is performed on each rivet, at one or more blows, according to the area of the piston, length of stroke, pressure of steam, &c.

Moulding-making Machine.

We are informed that a Mr. Terrel of this city has invented and put in successful operation a machine for making mouldings of various patterns for carpenters' work. The machine works with the same facility with which boards are planed by the common planing machine. We shall explain the principles of its operation in our next.

Inflammable Shot.

Mr. John Scott, of Philadelphia, has invented a composition for coating cannon balls, which will become ignited by the escape of the ball from the cannon, and the burning mass being distributed among the splinters made by its passage through the timbers of houses or vessels, will produce combustion wherever it strikes.

The following are the claims of inventors to new inventions recently patented, but of which we can give no description.

BY THOMAS A. CHANDLER.

Dec. 9, 1846.

Improvement in Mortising and Tenoning Machines.

[redacted]hat I claim is combining with the two par[redacted]ernate moving headers, two alternate [redacted]utters connected to and moved by [redacted]d excentric pendulum that moves [redacted]her the several parts be con[redacted]ed and operated in the manner [redacted]rposes described, or other mode [redacted]the same.

BY HORACE BAKER.

Dec. 9, 1846.

Improvement in apparatus for jointing staves.

What I claim is the combination of the carriage for holding the staves with the two [redacted]es in one stock or frame, at a distance [redacted]ual to half the length of the stave, and [redacted]th cutting outward from the centre of mo[redacted]n.

BY BENJAMIN PINKLEY.

Dec. 9, 1846.

Improvement in bedstead fastenings.

What I claim is making the sharp metal spurs or segment of threads formed with a sharp and reduced edge to the tenons, in combination with the mortises in the posts, with recesses for the admission of the spurs, that the shoulders of the rails may be brought up to the posts before the spurs are worked into the wood, whereby perfect joints can be obtained at each end of the rail, and the sacking pins be placed and retained.

BY NORBERT RILLIEUX.

Dec. 10, 1846.

Improvement in sugar making,

What I claim is: first, the method of heating the saccharine juice in a heater, preparatory to its introduction in the evaporating pans, by means of the waste hot water or escape steam from the evaporating pans. Second, the method of clarifying saccharine juice by heating it in a heater provided with a spout for the discharge of the impurities in the form of scum, and pipe for drawing off the clear liquid from the heater below the level of the spout which discharges the scum, and then bending up above the said spout to cause the liquid in the heater to rise sufficiently high to discharge the scum. Third, the method of cooling and partially evaporating saccharine juice or other liquids, by discharging the same in the shape of spray or drops, in chamber where it meets with a current of air. And this I also claim, in combination with a condenser, whereby the liquid intended to be concentrated is prepared for the evaporating pans and used as a means of condensing the vapor from the pans in which it is to be concentrated or by means of which the water used for the condensing jet is recooled. And fifth, the method of combining a vacuum striking pan, with a series of evaporating pans, the last of which is independent of the striking pan, and the last of the series of the evaporating pans can be in connection with the condenser, and work independently of each other, that either the striking pan or the series of evaporating pans can be worked without the other.

BY HENRY PACE, SEN.

Dec. 10, 1846.

Improvement in Bedsteads.

What I claim is the employment of a central rail, or its equivalent, to which are hinged arms which support the side rails instead of their being fixed to the posts.

BY KASIMIR VOGEL.

Dec. 10, 1846.

Improvement in Weaver's Harness.

What I claim is the making of said heddles by the doubling and twisting of yarn, by two sets of spools, each of which will form a cord of three or more strands; and the combining of such strands of yarn, so as to form the ends of the eye, by causing the spindles and spools constituting each set, to cross and re-cross so as to change places for the purpose of inter locking the yarn, and obviating the necessity of tying a knot, or forming a loop of the ordinary kind; and this I claim whether the crossing and re-crossing of the spindles be effected by hand or by special machinery adapted to that purpose.

BY JOHN GEROW.

Oct. 1st, 1846.

Improvement in Washing Machine.

What I claim is two plain disks 12 or 14 inches diameter, placed on an axle 15 or 18 in. apart with a set of fluted rollers on its periphery with pivots and staple with a board to slide backward and forward under the same on two springs to be set in motion with gear wheels, or panels and crank.

Importance of System.

If an individual would accomplish any thing worthy of particular notice, he must be systematic. He must have a time for every thing he wishes to do. He must not only rise regularly, not only be regular in taking his meals—but likewise in his labor, mental and physical. He must have stated times for attending to every duty. No man can be industrious without system. He may labor from morning till evening—he may be so weary at night from excessive toil as to be ready to sink into the earth—but he knows nothing of industry. He has not accomplished half what he might—true, he has exhausted a portion of his muscles, but there are others which have not exercised at all. A man may study one half of his time, and yet do as much manual labor as he who labors constantly without giving himself a moments time for intellectual improvement. To the young man it is especially important that he acquire systematic habits. If he does this he will scarcely fail of success in business, or of being an intelligent and respectable citizen.

New application of Water Power.

It is interesting to consider in what a variety of ways the force of water may be applied to drive machinery. Besides the three varieties of wheels, the overshot and the undershot, and breast wheel, we have the water-pressure engine, with its piston and cylinder, worked by jet of water like a steam engine; Barker's mill in which the water issuing from an orifice gives a motion to the machinery by its reactive force; and finally, a whole family of French water engines, of recent invention, called *turbines*. The turbine is a horizontal wheel, furnished with curved float boards, on which the water presses from a cylinder, which is suspended over the wheel, and the base of which is divided by curved partitions, that the water may be directed in issuing, so as to produce on the corresponding float boards of the wheel its greatest effect. The construction of the machine is simple; its parts not liable to go out of order; and, as the action of the water is by pressure, the force is under the most favorable circumstances for being utilized. The effective power appears to equal that of the overshot wheel, but accompanied by some conditions which renders it peculiarly valuable. In a water wheel you cannot have great economy of power without very slow motion; and hence, when high velocity is required at the working points, a train of mechanism is necessary, which causes a material loss of force. Now, in the turbine, the greatest economy is accompanied by a rapid motion. If a turbine be working with a power of ten horses, and its supply of water be suddenly doubled, it becomes 20 horse power; if the supply be reduced to one half, it still works five horse power; whilst such sudden and extreme changes would altogether disarrange water wheels, which can be constructed for the minimum, and allow the overplus to go to waste. By the employment of a close pipe, water is now brought from a distance to several French factories, and there delivered with full force due to the altitude of its source on the turbine. It is singular that the old system of the aqueduct and the close pipe should have been brought again into comparison with another in modern times, in the application of the principle of hydrostatic pressure for the purpose of transferring the seat of power to a more convenient site, by the French machinists, at the same time that men of equally high attainments in Britain, for the same purpose, were resorting to the old device of the aqueduct. We allude to that bold piece of engineering enterprise, the transport of the Shaw's water river, with its whole accumulated fall of 512 feet from the remote and nearly inaccessible valley where it had for so many ages expended its force in vain, into the populous town of Greenock, where all its energies were in immediate requisition. "Thus," says Mr. John Scott Russel, "a power has been brought six miles and a half to the suburbs of a populous town, equal to the power of thirty steam engines of fifty horse power, being equivalent to the creation of wealth or production of capital to the extent of £7,500, and the annual effect of which when fully employed, will be something like the employment of 7000 people, and the annual distribution of something like £300,000 per annum in wages, beside the ample supply of water for the town."—*Eng. pap.*

Cincinnati Brick Machine.

It is reported that the new cylinder brick machine at Cincinnati will turn out 40,000 smooth surface bricks per day, with the aid of only five men.

[COMMUNICATED.]

Manufactures—Inventors—Roads—Acclivity—Laborers in Factories and on New Farms.

COTTON HOME MANUFACTURES.—It is very true, in politics especially, that if you convince a man against his will he will be of the same opinion still. Veritable assertions and even demonstrations have but very little weight, when coming from those in opposing ranks; but statements from impartial and neutral sources produce their legitimate convictions. In Professor Renwick's Science of Mechanics applied to practical purposes, published by the Messrs. Harper in 1844, I find the following under the head of cotton spinning.

"The quantity of cotton manufactured in the United States is now as great as was consumed in Great Britian in 1814: the Southern planters have found a new market equal to the fourth part of their whole crop, and the Northern wheat-growers receive a price for their produce not graduated by the cost of production, but by that of importation from other countries. However foreign from our subject, we cannot here help remarking, that in the face of these facts, the agriculturists of the United States are taught by political theorists to look with jealousy on the prosperity of their manufacturing brethren."

INVENTORS.—Most inventors would find it economical to have an extensive library on mechanism and the arts. They should be subscribers to at least one mechanical paper.—They will thus be spared the expense and mortification of inventing old things.

ROADS.—In speaking of turnpike roads Pro. Renwick says: In some of the roads in the United States, although wide enough for four carriages, it is unsafe to pass one which occupies the crown of the road, on account of its great convexity. It is becoming very common to turnpike very narrow, leaving scarcely space for two loaded wagons to pass. This saves labor in making the roads. By making the convexity the arc of a smaller circle, it more readily turns off the water. This advantage is at the expense of safety.

ACCLIVITY OF ROADS.—Country people in laying out roads should consider what an immense weight can be drawn on a level railroad and that a comparatively slight acclivity will render the locomotive power less. The same law, in a considerable degree, holds good in reference to common roads.

PAVEMENTS & WHEELS.—Will Mr. Scientific American inform us whether the tires of the wheels of our omnibuses are more injurious to our common pavements when new or after they have become convex by wear? To save our pavements should the tires be made slightly concave?*

FEMALES IN FACTORIES AND ON NEW FARMS.—It is fashionable in certain quarters to decry manufacturers for their great profits at the expense of the comforts and health of the female operatives. Let us hear what Prof. Renwick incidentally says on this subject, on page 292 of his Science of Mechanics. "The business of cotton spinning has been much decried as injurious to the health and morals of the persons employed in it. This however, has been thoroughly disproved by accurate statistics in Europe, whereby it appears that the factory workmen are not only better paid, but have a better chance of life, and higher moral character than the agricultural laborers. In that conntry it has certainly tended to elevate a debased population, and therefore, it is not to be feared that in ours it will lower the standard of morals, while it will add materially to the comfort and independence of those who must be supported by the labor of their hands. There can be no comparison between the comforts enjoyed by the females employed in manufacturing establishments, and those who accompany their families in agricultural establishments in the new States of the West." Had the sickness that has prevailed the past Autumn Northwest of the Ohio, occurred in the manufacturing districts, partizans would have made a noise on the subject.

* In answer to this query of our correspondent, we should reccommend that for the durability of the tires, they should be made convex; but that for the benefit of the pavements of this city, they should be made as convex as a skate-iron, that they may gouge and chip down the paving stones till they are reduced to a plane surface.

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NEW YORK, DECEMBER 26, 1846.

Popular Absurdities.

We had proposed to publish in our last number, some remarks on the theory of some of our popular professors ; but they were excluded from that number by a press of other matter.

We commence with Professor Olmsted's remarks on the " line of swiftest descent." We gave an illustration in No. 11, of a curious fact with regard to the descent of a ball on an inclined curve, or arc of a circle, showing that the time of its descent from any point in the curve to the bottom would be the same ; but we find in Olmsted's Philosophy an article attributing this property to the *cycloid* instead of the regular curve or arc. After defining the cycloid as " the curve described by any point in the rim of a coach wheel, while passing from the ground to the ground again," (which is neither more or less than the longitudinal half of an ellipse, the extremities of which are parallel) he says : " It is a remarkable property of this curve that the time occupied by a body descending from any height above the lowest point are all equal to each other;" but *we* cannot imagine any position in which a cycloid can possibly be placed so that a ball could descend (rolling) thereon with any manner of velocity.

Professor Mapes, in a recent address, improves on this error concerning the cycloid, and avers that " there is no figure in which a body can be moved with so much velocity, and such regularity of speed, not even the straight line :" (! !) and adds that the eagle has discovered this, and that when he pounces on his prey, he describes the figure of a cycloid. We should feel curious to know what position of the cycloid the eagle describes in his pouncing descent ; but should not readily take the eagle's authority for a point of theory in direct opposition to our own observation of the laws of mechanical motion. Neither should we abandon positive evidence to adopt the fishes theory with regard to resistance of fluids, although on this subject Professor M. says " there is a form called the *solid of least resistance* which mathematicians studied many years to discover ; and when they had discovered it, they found they had the form of a fish's head." It was lucky for those " mathematicians" that they were not *our* scholars, for we should have pulled their ears for their stupidity before they were ten years old, if they could not see that a circular revoloidal spindle (formerly called elliptic spindle) would encounter less than half the resistance, that would the fish's head figure. In the same discourse it is remarked that a bird " has the power of forcing air into the hollow parts of the body, and thus assist his flight :" but we cannot see how a body is rendered buoyant by having a quantity of the same fluid in which it floats, stowed away in the interior.

But to return to Olmsted's Philosophy. On the subject of the resistance of fluids, it is stated that when the velocity becomes very great, as that of a cannon ball, ' the resistance increases in a much higher ratio than the square of the velocity.' We must be permitted to consider this theory as a gross absurdity until we see some reasons or illustrations in support thereof. It is well known that the velocity of the air, when starting from a state of rest to fill a vacuum, is limited by its own inertia, and hence some have supposed that a vacuum generally follows a cannon ball : but this is not the fact, because a quantity of air, having by its elasticity, overcome its inertia, follows in the wake of the ball, keeping in constant contact. And even if a vacuum were produced, the resistance could not be increased by acceleration beyond the square of the velocity, on any established or known principles.

Again, on the subject of the escape of water from a reservoir through an orifice, it is stated that " it has been found by experiment that a vessel of tin with a smooth hole formed in its bottom, did not discharge water as rapid ly as another containing the same weight of water, and an orifice of the same dimensions, to which a short pipe was applied." No reasons are given for this phenomena, and we sometimes find it difficult to believe a simple assertion, without the appearance of reason. In this case, however, we can understand that if the inserted tube projects downward, the water in passing through the tube acquires additional velocity by its own unimpeded gravity, and on the principle of suction draws the water from the reservoir with the same velocity that it would have had without the tube, if the depth of water in the vessel had been equal to the length of the tube in addition to the supposed depth. But the escape of the water is not otherwise facilitated by a tube.

(*To be continued.*)

Editorial Ability.

Newspaper writing has grown to be an art of itself. Many a literary man who thought because the " greater includes the less," every author is *ex-officio* qualified to be an editor, has sunk back into the rear place of the press, after some smart writings had shown his bookish talent and his inability to deal with facts. Others who could pour forth volumes, have failed, because they could not cope with hydraulic pressure, or prompt selection of salient points needed for the space and rapid comments of the journal. Take the best papers of London or Paris, different as the circumstances of the case may be, and you must allow that it is not every booby that could seize the moral spirit of passing history. The same may be said, with equal justice, of the American press. People of some little talent fancy they can edit a newspaper, if they can do nothing else ; but they essentially find their mistake. Not only is intellect, but a knowledge of the world, miscellaneous information, tact, industry, rapidity of thought, a nervous style, and a capacity at once to catch the strong and weak points of every subject, are required for a good editor. —*Eng. pap.*

The Randolph Slaves.

We mentioned some months since that a large number of colored peope, formerly the slaves of John Randolph, had passed through Cincinnati, on their way to Mercer County, Ohio, where land, provisions, and farming utensils had been prepared for them : but we did not mention that on their arrival on their own land, the people of Mercer Co., even those who had sold them the land &c. raised a mob and drove them off, and they were constrained to seek unconditional service among the more friendly white families in different parts of the state. The abolition papers are now comforting themselves by turning the apparently adverse circumstances to good fortune, on the ground that the negroes are acquiring a course of useful instruction in agricultural pursuits of which they were entirely ignorant (having been accustomed to raising tobacco) and which is indispensable to their success in farming for themselves.

The Smithsonian Institute.

The Regents of the Smithsonian fund have performed their business according to the strict rules of aristocracy and adjourned. Every movement on the subject, (as every observing man forsaw,—and the donor should have known would be the case) appears aimed to favor those who are in the favor of the movers. $20,000 have been voted for a library, and a salary of three thousand dollars per annum for a librarian. The salary of the secretary has been fixed at $3,500 per annum. This fat office of eleven dollars a day, and not much to do, is expected to be given to Professor Henry. The other offices are to be filled on the same scale ; and this the way the *community* is to benefitted by the Smithsonian fund.

New Alarm Bell.

A mammoth bell has been brought to this city from Troy and is intended to take the place of the one which now hangs above the City Hall. It was manufactured by Andrew Meneely, at West Troy, and weighs 7845 pounds.

Specie Returning.

The steamer Cambria brought out from England one hundred and eighteen thousand, four hundred and thirty dollars in specie.

Enterprise in Wayne, Me.

SCYTHE FACTORY VILLAGE.—This beautiful and picturesque village is situated at the foot of a pond extending two miles southward from Fayette Mills. Here is to be seen the largest Scythe Factory *in the world.* And here is a true specimen of the results of the skill and enterprise of our own citizens when faithfully applied. Eight years ago the stranger would have seen here two or three old houses, and an old set of mills in which was placed machinery for sawing lumber, grinding and fulling cloth. Now in addition to machinery of this kind there are three large buildings for the manufacture of scythes, giving employment to some 100 hands and turning out about 300 dozen scythes per week. About 9000 dozens were finished last year, and this year they hope to make some 15,000 dozens. The work is nearly all done by the aid of machinery. In place of the two or three old houses, there are now about 25 beautiful houses, painted white, not only bearing testimoy to the thrift and enterprise, but also to the taste of our citizens. A sample of the scythes made at this factory, was sent to Washington, at the late National Fair, and the diploma was awarded to the manufacturer though other samples from this country, and from England were there in competition. It is worthy of notice that all this has been done by private enterprise. without the aid of chartered rights, or any exemptions from taxation.—The dozen sent to the fair at Washington, marked at the factory price, was found to be two dollars cheaper than an English article of inferior quality, this showing that if the home market did not demand all that are made and even more than it does as yet, we could compete successfully with the English manufacturers *in their own markets.*— *Maine Cult.*

On the Study of Natural Philosophy.

There is no occupation which so much strengthens and quickens the judgment as the study of natural philosophy. This praise has been bestowed on mathematics ; yet a knowledge of abstract mathematics existed with all the absurdities of the dark ages ; but a familiarity with natural philosophy, which comprehends mathematics, and gives tangible and pleasing illustrations of the abstract truths, seems incompatible with any gross absurdity. A man whose mental faculties have been sharpened by acquaintance with the exact sciences, in their combination, and who has been engaged, therefore in the contemplating *real relations,* is more likely to discover truth in other questions. and can defend himself against sophistry of every kind. We cannot have clearer evidence of this, than in the history of the sciences, since the Baconian method of *reasoning by induction* took the place of the visionary *hypothesis* of preceding times.—*Dr. Arnott.*

Capital Punishment.

A new argument in favor of capital punishment has been put forth by the Sunday Dispatch ; namely, that those who are hung are those who being *poor* and ignorant were never reached by the gospel, and would never have been reached by the clergy had they not fallen under the sentence of death. But when this occurs " human beings whose spiritual welfare had been before entirely lost sight of, suddenly become objects of interest," and they are *now* visited by the clergy to prepare them for death. Thus it is proved that the salvation of a certain number is secured by hanging them.

An Expensive Wife.

A case was lately decided at the Court of Queens Bench in which a jury refused to make a husband responsible for an extravagant milliner's bill of goods taken by his wife. The bill contained among other things, ten new bonnets, and forty-three pairs of gloves in seven months. Of course they must have a new law, limiting the number of bonnets, gloves, &c. which a lady must be allowed to purchase at any one shop, in a given time.

Marshall's No. 90.

We still retain the opinion that better bargains in under clothing, are given at Marshall's Troy Shirt Depot, No. 90 Chatham street, than at any other shop in this city.—Our readers who make the trial will thank us for this notice.

RAILROAD INTELLIGENCE.

Worcester and Nashua Railroad.

Most of the grading and masonry of this road are put under contract, at rates within the estimates of the engineers, and the contractors agree to take 20 per cent of the amount in the capital stock of the company. The difficulties, which at one time seemed to beset this work, are now all removed, and in the efficient hands in which its management is placed, there can be no doubt of its being pushed forward to a completion in the shortest possible time.

The Stony Brook Branch.

This branch road is to connect the Worcester and Nashua road with Lowell. The Lowell people are stirring themselves to build the Stony Brook Branch of this road, which will give us a direct communication with that city. They express a determination to go ahead with it, so that it may be completed as soon as the main road is.

Cape Cod Branch.

It is reported that the stock of this road,—$100,000,—has been nearly or quite all taken, and everything connected with the enterprise seems to wear a favorable aspect; and we are assured that the work will be completed within the limits prescribed by the charter.

Androscoggin and Kennebec Railroad.

An engineer has been engaged to survey the route of this road from Lewiston to Cocnewogin pond, in Monmouth, and that part of the route will be put under contract so as to begin operations early in the spring.

Rutland Railroad.

The President of the Champlain and Connecticut River Railroad advertises for proposals for building the road from Bellow's Falls to and including the summit at Mount-Holley thirty-four miles, and from Burlington to Brandon, about fifty miles.

New York and Erie Railroad.

All the contracts for building this road from Port Lewis to Binghampton (13 miles) have been taken. The aggregate amount of the contracts is $1,900,000. This is $1,000,000 less than the estimates! Twenty-two contractors have taken the whole job, at an average of 42 cents per yard for rock and 10 cents for earth excavation. This is considered ,o low; but the contractors are said to be responsible men. At this rate $6,000,000 would complete the road to Dunkirk.

The receipts of the Western railway last week were $19,000, against $14,200 for the corresponding week last year.

Taylor's Money Reporter.

This useful, not to say indispensable periodical, partakes largely of the characteristic of the age, that is, improvement. In addition to the ordinary bank note lists, which is revised weekly, it presents beautifully engraved fac similes of all the gold, silver and copper coin, of all nations with their current value. Published by S. Taylor No. 90 Broadway.

Advice.

If any of our young friends are designing to attend the Holyday Balls, we would recommend them to go at once to Messrs. Steele & St. John No. 27 John street, and get measured for a new suit of clothes. We know from personal observation that they excel on fit and style, and for variety of Cloths, every one that gives them a call can satisfy themselves that their assortment is well selected, and very cheap.—See Card in another column.

To New Subscribers.

Those subscribing to the Scientific American will be furnished, if desired, with all the back numbers of the present volume. Bound together at the end of the year, they will form a handsome and valuable work.

THE
SCIENTIFIC AMERICAN.

Persons wishing to subscribe for this paper, have only to enclose the amount in a letter directed (post paid) to

MUNN & COMPANY,

Publishers of the Scientific American, New York City.

TERMS.—$2 a year; ONE DOLLAR IN ADVANCE—the remainder in 6 months.

Postmasters are respectfully requested to receive subscriptions for this Paper, to whom a discount of 25 per cent will be allowed.

Any person sending us 4 subscribers for 6 months, shall receive a copy of the paper for the same length of time.

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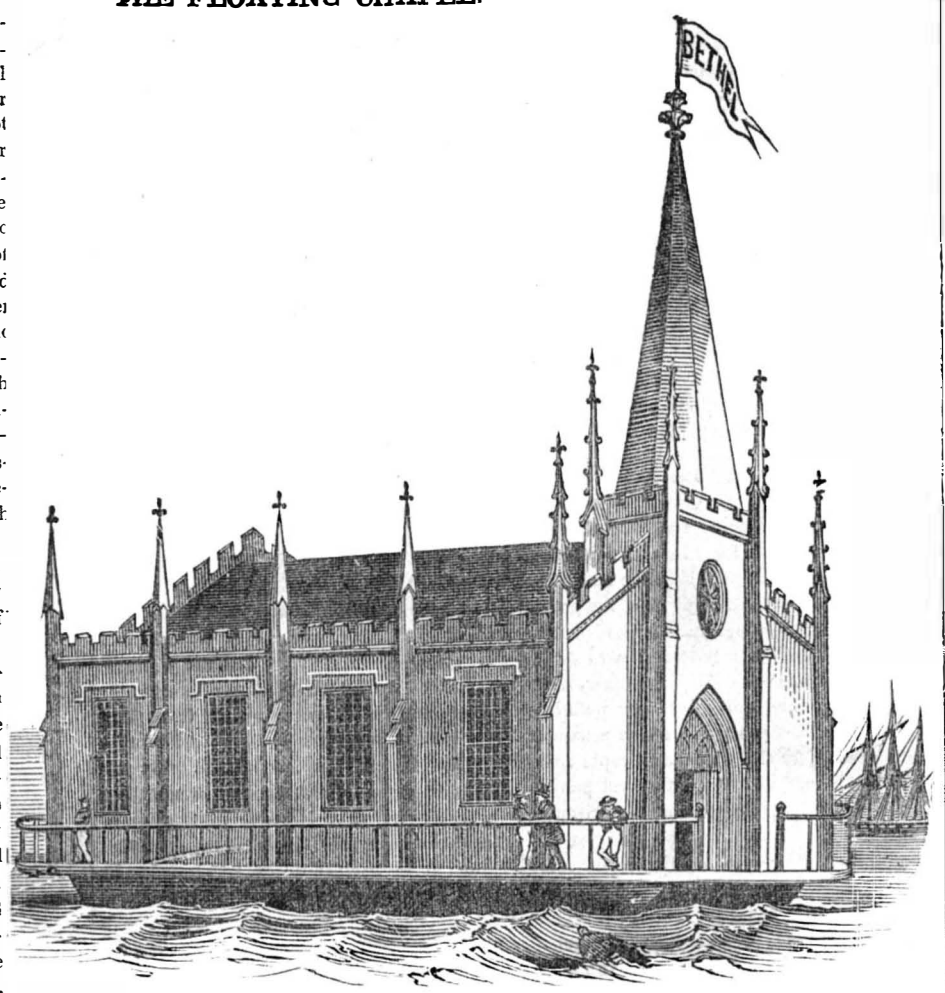
THE FLOATING CHAPEL.



It must be a source of great gratification to the gentlemen who were instrumental in procuring so beautiful and appropriate a place of worship for the seamen, to know that it has not only answered, but far exceeded their most sanguine expectations. Thousands of them have attended service there during their stay in port, who had not seen the inside of a place of worship, nor heard the gospel preached for years before. Summer and winter this chapel is well attended, and no assembly of persons can be brought together who conduct themselves with greater decorum than do the hardy mariners who weekly assemble there.—Their rivetted attention to all that passes, would teach a good lesson of behaviour to a large portion of our church going citizens, and remind them of the command we see so often neglected in places of public worship, " Keep thy feet when thou goest into the house of God."

By far the greater portion of our citizens are under the impression, from the very calling of the seaman—the roaming character of their lives, and their generally light and frivolous conduct while on shore ; that they are a class of persons upon whom very little or no impression can be made, in regard to any matter beyond the time being. This, however, is a great mistake; and one visit to the chapel will readily dissipate all such impressions. It is true that they are a very peculiar people, and it is not every minister who is fitted for taking charge of a congregation of seamen. It requires one to become acquainted with their habits, their likes, and their dislikes ; and to reach their minds as a skilful pilot would a harbor, whose entrance is obstructed by rocks and shoals. But, once becoming acquainted with their dispositions—and applying the subjects to things drawn from the every day circumstances of life, and also by making a proper application of circumstances related by themselves from time to time—is a sure method of gaining the undivided attention of "Poor Jack." The gentleman who at present has charge of the Chapel, and who probably has had charge of the same since it was first opened—seems to have made this his study, and is most eminently qualified for his station, and always has on hand a store of anecdote, to which he affixes a moral bearing.

CHEMISTRY.

Continued from No. 13.

OXYGEN.

Oxygen gas is a permanently elastic fluid, that is, one which no compressing force, or degree of cold hitherto applied, has ever been able to reduce to a liquid or solid form. It forms, as we have already observed, one of the constituents of the atmosphere; is colorless, and is destitute of taste or smell. Its specific gravity, is 1-1111, that of common air being reckoned unity. Combustible bodies burn in it with more brilliancy, and more light and heat is evolved, than when combustion takes place in the atmosphere If a candle, the wick of which is red-hot, be introduced into a vessel containing oxygen, the candle will instantly be lighted. Oxygen has the power of combining with every other simple body ; the multifarious compounds which it thus forms, such as oxides, acids, and bases or alkalies, we have already adverted to. In the act of respiration oxygen, in the nice economy of the human body, is made to unite with, and becomes a portion of the human frame. Vegetables also inhale and exhale it at certain seasons, so as admirably to supply what is absorbed by animals. It is the intensely rapid chemical union of oxygen with the combustible body which gives rise to the light and heat in our common fires, candles, &c. It may be readily produced from a variety af substances, as, for, instance from saltpetre or the black oxide of manganese. These may be introduced into a gun-barral, and the touch-hole plugged up. From the orifice of the barrel let a tube be conducted into an inverted glass jar, filled with water.—When the other extremity of the apparatus is subjected to heat, the oxygen gas is expelled from the manganese, and entering the glass jar, displaces the water and fills the vessel.—This is a cheap and easy method of obtaining this remarkable aeriform body.

Oxygen can be prepared by putting 1000 grains of binoxide of manganese into a retort with an equal weight of aqueous sulphuric acid. This is done by means of a retort fixed over a spirit-lamp. The bent tube of the retort enters a pneumatic trough, in which jars are placed for receiving the gas as it passes from the neck to the retort.

HYDROGEN.

Hydrogen gas is a permanently elastic fluid, transparent and colorless, and when *pure*, destitute of taste or smell. It can scarcely be said to exist in an isolated state, but it forms one of the constituents of water, from which it can be disengaged by various simple processes. It is the lightest body with which we are acquainted; and is employed in combination with other gases to inflate balloons. A bladder filled with this gas will ascend in the air, in the same manner as a piece of cork or wood plunged by force to the bottom of a vessel of water. Hydrogen will not support combustion, but is itself remarkably combustible. When one volume of oxygen is mixed with two of hydrogen, it burns with a loud explosion, by an electric spark, or the contact of a red-hot fire. The product of this experiment is water. It is said that a few cautious draughts of this gas may be taken, but it cannot be inspired for any length of time without occasioning death. Frogs live in it for a long time showing these animals to be very tenacious of life. By far the most important compound of hydrogen with any other substance is that of oxygen, forming the indispensable fluid, which covers nearly two-thirds of our globe, (water.) It unites with the other supporters of combustion; but the compounds, except muriatic acid, already mentioned, are not of any great importance.

Hydrogen may be prepared by putting 500 grains of zinc into a common beer bottle, and pouring upon the zinc three ounces of water and five drachms of aqueous sulphuric acid.—The hydrogen is disengaged, as the acid, the oxygen in the water, and the metal combine. By means of a bent tube from the bottle the gas can be conveyed into jars placed in a trough.

AZOTE, OR NITROGEN.

This gas is permanently elastic, transparent colorless, and inodorous. It is very little lighter than oxygen. When breathed, it destroys animal life ; and a burning body, if immersed in a jar containing it, is instantly extinguished. It is not combustible ; it enters extensively into combination ; it is an abundant element in animal matter ; and its existence in such large quantity is a chief distinction between the constitution of animal and vegetable life. Its existence in the atmosphere we have already adverted to. Whether it is chemically united with oxygen in that compound, or only mixed with it, is not precisely known. That it has the property of combining with all supporters of combustion, there can be but little doubt ; but the subject has not yet been thoroughly investigated.

The Superiority of Compressed Air as a Motive Power.

(*Concluded from No.* 13.)

I hope the above description will enable persons taking an interest in the matter to understand something of the nature of the plan proposed. I will now speak of it in reference to its application to railway purposes.—The first thing to be considered is, the amount of power, directly applied, requisite to drive a train of such weight as, it is probable, would have to be driven at such and such times and velocities, &c. &c. I shall leave it to practical men to determine what that amount of power may be ; but if a 15 in. tube, with a working pressure of 12 lbs. to the inch, does for trains of ordinary weight, one of 8 in. diameter, with a pressure of 45 lbs. per inch will yield a greater working power. Now, it appears to me that, if two thirds of the quantity of metal used in making the large tube was used for the smaller one, it would have greater strength in proportion to the increased pressure it would have to sustain : if ribs were cast on a tube for compressed air, they would be of more service in preventing its bursting, than on a tube for rarefied air to prevent a collapse—for, in the former, they have to resist compression, the separating strain being borne by the whole length of the interior of the tube ; but, in the latter, they have to resist separation,—and, as they are some three or four feet apart, each rib has to bear all the separating strain on the tube for that distance, and every body knows for which of these two purposes cast iron is best adapted ; but I am of opinion, that pipes of 8 in. diameter, with an opening or slit, could be made of wrought iron without ribs, but thick opposite the opening, and diminishing towards it, so as to give them equal strength in every part. For the purpose of easy explanation, I will suppose this plan to be applied on a short line of railway—say of 10 miles in length, with a station at each end and one about half way—with 8 in. tube, and travelling power 46 lbs. per in. of the piston, and trains to start from each end every half hour in the day, and complete the distance in 10 minutes—the up-train arriving five minutes before the down train started, and vice versa. A quantity of compressed air, equal to the capacity of the tube, would have to be supplied every 15 minutes—a magazine capable of supplying that quantity should be provided at each of the end stations, and one at the intermediate one, two or three times as large : they should communicate with each other by an iron pipe passing along the line of railway, and a steam engine (for the present) should be placed at the intermediate station only, competent to supply the requisite amount of power. Now, if the magazine of the capacity stated had to be made of iron of sufficient substance to bear a strain of 45 lbs. per inch, and if a building had to be a reservoir of water at the top, of such height and dimensions as to answer the purposes previously explained, the expense would be an insurmountable obstacle to carrying out this plan. But I propose to sink wells to the requisite depth—which to give a pressure of 45 lbs. to the inch, will be about 109 feet—the one at the intermediate station should be 4 or 5 feet more than the others. The bottoms of these wells should be enlarged, and a magazine formed in brick-work, with an iron pipe ascending from its top, connected with the traction and communication pipes. The object of the magazine, or rather the safety valve, at the intermediate station being at a greater depth than the others, is to prevent the air escaping before they were filled. The well or shaft to be the channel down which water is to be supplied to the magazine—the top of this well to be surrounded by a reservoir : when a train arrives at either of the stations, a valve should close up the tube, and prevent the compressed air from escaping, and a pipe should convey it back to the cylinder of the air pump, to be used over again—of course, the air pump would be a double acting one; and the compressed air from the tube, entering thro' the bottom of the cylinder during the piston's ascent, and thro' the top during its descent, would cause the piston to be moved up and down with but little aid from the steam engine at the commencement, and a cylinder nearly full of compressed air would be driven from the magazine at each stroke. It is not of particular consequence whether the magazines are situated exactly at the stations or not.—They may be disposed in some convenient situation near the stations.—*Lon. Min. Jour.*

NOTE.—The writer of the foregoing is evidently in error in supposing that compressed air will furnish as much power by its expansion, as that required for its compression.—The caloric or heat contained in atmospheric air, constitutes a considerable portion of its elasticity ; and when air is compressed it becomes proportionably hot, and the heat thereof radiates to surrounding objects, and the elasticity or expansive power of the compressed air is thereby diminished. So it will require about 30 per cent more of steam power to compress the air, than would be required to propel the trains, &c. by steam power direct. —*Ed. Sci. Am.*

The Editor.

Some disaffected cotemporary—probaly a politician disappointed of office,—describes an editor as being the dupe of destiny, and says " his lot was knocked down to him a bargain, and it turns out to be a take in. His land of promise is a moving bog. His bed of roses is a high-backed chair stuffed with thorns. His laurel wreath is a garland of nettles, His honors resolve themselves into a capital hoax —his pleasures are heavy penalties—his pride is the snuff of a candle—his power but volumes of smoke.

Scarcity of Wood.

The Albany Atlas says than one of the oldest wood merchants on the dock states that he has never known the market so bare as at present. The prices for hickory wood $8 per cord ; hard maple and iron wood $7,50, do.—Oak wood, $6 do. This will be good news to those engaged in the coal business.

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FOREIGN NEWS.

Two steamships have arrived within a few days, but as each chanced to be just in season to be too late for us to notice them in season, we conclude to say nothing about them.

There was no news by these arrivals very interesting, but we glean the following items.

Mr. Rowland Hill, who first advocated the cheap postage system, has been appointed Secretary to the Postmaster General, with a salary of £12,000.

The Bey of Tunis is now in Paris on a visit, and royal honors and great attentions are paid him.

The Spanish papers call on France and England to establish a monarchy in Mexico, to save that country from falling into the American Union.

The expected ordinance of the Pope, authorising the formation of four lines of railway in his dominion, has at length appeared, to the great satisfaction of the people. His holiness has also authorised the citizens to form their own local guard.

The Garrick Theatre of London, was destroyed by fire, on the 4th ult,

The political affairs of Europe evidently stand in a precarious state, and there are some apprehensions of a general outbreak of hostile commotion.

THE OPINION OF THE PRESS.

(*Continued from No.* 9.)

Scientific American.—There is published every Saturday, in New York, an elegantly printed newspaper, by the title of the "Scientific American." It is illustrated with engravings. It is "the Journal of Scientific, Mechanical, and other improvements." This paper, which is furnished at two dollars per annum, contains the most valuable information, written in plain and comprehensive language. We pen this paragraph with a fervent hope that the attention of our readers may be called to the "Scientific American," for in a family where there are children, we know of no periodical of the kind, that we would sooner recommend to their patronage. It is a most capital newspaper for schools. We recommend it as a periodical that is calculated to elicit and develope mechanical talent, and improve the mind of those who may read it.—Rufus Porter is editor,—and Munn & Co. 128 Fulton street, publishers.—*Journal, Flushing, L. I.*

We have received the two first numbers of vol. 2 of the "Scientific American," published weekly in New York. The American has become deservedly popular with all classes.—These numbers come in quarto form, and are exceedingly neat in appearance, and the contents varied and interesting.—*Mirror, Cabotville, Mass.*

The Scientific American appears in a large quarto form, four columns to a page.—We like its new dress much better because it now can be much more conveniently preserved (and if it is not worth preserving what paper is?) and kept where it may be ready for reference. We would advise all who wish a good scientific paper to subscribe. Send to Munn & Co. N. Y., 2 dollars.—*Tocsin, Ann Arbor, Mich.*

☞The "New York Scientific American," should be in the hands of every artist and mechanic. It is one of the most valuable papers now published. Young men could not spend their money to more advantage than to taking this. It is published by Munn & Co., New York, at $2 per annum.—*Phoenix, Bristol, R. I.*

Scientific American.—This excellent journal has been much enlarged and improved, and should be in the hands of every mechanic. It is truly a valuable paper.—*Gem of Prairie, Chicago, Ill.*

Scientific American.—By the [illegible] of the proprietors we have be[illegible] enabled to add to our exchange list the [illegible]k by Munn and Company, at the low[illegible] It is published in New [illegible]ce of two dollars a year.

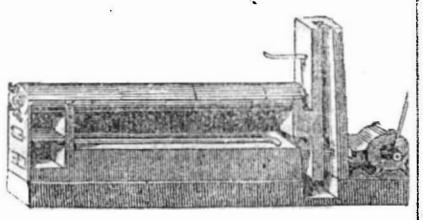
We consider the Scientific American as one of the most useful publications of the day.—It is, what it professes to be, "The Advocate of industry, and Journal of scientific, mechanical, and other improvements" It seems to be an indispensable requisite to scientific men of all kinds, and particularly to Mechan ics. We cordially recommend it to the public —*Reporter, Tallede ga.*

The Scientific American.—We would call attention to the advertisement, in another column of this most valuable publication. In this intelligent age, information is sought, on all practicable subjects, by rich and poor, and the terms of this paper are most reasonable —We heartily recommend it.—*Reveille St. Louis, Mo.*

Scientific American.—A most admirable weekly quarto journal, bearing this title, has just come to hand, and it affords us gratification of no ordinary measure, to recommend it to the patronage of our friends, especially those who are engaged in any of the branches of mechanical industry. It is published by Munn & Co., and edited by Rufus Porter Esq., at $2 per annum —*Luminary, Atlanta, Ga.*

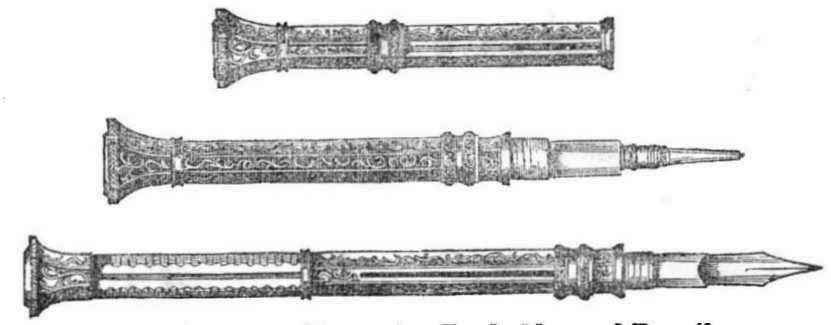
The Scientific American, published by Munn and Co., New York, and edited by Rufus Porter, is all that its prospectus promises, and in its quarto form, can be easily preserved for future reference. It is not only an able scientific expositor, but an interesting and valuable chronicle of improvements and inventions in the arts. Price $2 per annum.—*Democrat, Brattleboro, Vt.*

Patent Heat Generator.



The editor of the Tribune considers one million of dollars a very moderate estimate for the fuel used in this city in generating heat to propel machinery. From this estimate we may form some idea of the immense sum annually expended throughout the whole country for this purpose. An invention that would promise a saving of five to ten per cent on this great expenditure, would be pronounced of national importance. What shall we then say of one that has been found actually to make a saving of *thirty three* per cent! Three years of experience in various parts of our country, have abundantly established the fact that Messrs. Griffin & Co.'s Patent Heat Generator will accomplish this great saving in fuel used for power purposes. It is a matter of much surprise that this improvement is not introduced in all places where steam is generated. It is of importance in this day of active competition, that our enterprising and considerate countrymen should speedily avail themselves of this effective and fuel-saving furnace. The uninterrupted prosperity of our manufacturing interest especially is intimately connected with its general introduction. No improvement of the age has more fully sustained its recommendation. Among the highly respectable testimonials we find C. C. Salisbury, of Troy, has used it three years; Cook & Engle, Bach & Co., of Brooklyn, more than two years; John Dale, Lansinburgh; Maryland Penitentiary, Raltimore; J. H. Cheever, Boston; Lane & Tippett, Methodist Book Concern; Ross & Co., and J. W. Harvey, New York, about one year. Among those who a[illegible] are now introducing this improved furna[illegible] Cotton Dr. Durfrey, and Col. Burden, in th[illegible] others, of Mills at Fall River; C. W. Bur[illegible]nd Mr. Willi- Providence; Collins & Co[illegible] ams, Stonington.

[illegible] the cut it will be pe- From an inspect[illegible]provement consists princ- ceived that the [illegible]flues at the bottom of the fi[illegible] pally of s[illegible] which is so constructed as to retain cham[illegible]e heat. The combustion is produced b[illegible] a[illegible] the blower. The expense of a high chimne[illegible] is avoided. We have been told that an engin[illegible] has been kept in motion *eighteen hours* aft[illegible] the combustion of the coal had ceased. M[illegible] G. has made a recent experiment, by whi[illegible] the furnace is adapted to low pressure ste[illegible] boats. Office 193 Broadway. S. I



Bagley's Patent Extension Penholder and Pencil.

THIS is the most compact, complete, convenient and useful pocket companion ever offered to the public. The multiplicity of its usefulness and the smallness of its size, renders it a perfect Multum in parvo.

In the short space of 2 3-4 inches is contained a Pen, Pencil, and a reserve of leads, and by one motion slides either the pen or the pencil out and extends the holder to six inches, which is but little more than half the length, when shut up, of the common pen holder, but when extended is one fourth longer. This article is secured by two patents, and the Manufacturers are now ready to receive orders for them in any quantity, either of Gold or Silver, together with his celebrated ever pointed Gold Pens, which need no proof of their superiority except the increased demand for the last six years, and the numerous attempts at imitation.

A. G. BAGLEY, No. 189 Broadway.
New York, Sept. 1, 1846. o24 tf

ADVERTISEMENTS.

☞ This paper circulates in every State in the Union, and is seen principally by mechanics and manufacturers. Hence it may be considered the best medium of advertising, for those who import or manufacture machinery, mechanics tools, or such wares and materials as are generally used by those classes. The few advertisements in this paper are regarded with much more attention than those in closely printed dailies.

Advertisements are inserted in this paper at the following rates:

One square, of eight lines	one insertion,	$ 0 50
" " " "	two do.,	75
" " " "	three do.,	1 00
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" " " "	three do.,	3 75
" " " "	six do.,	7 50
" " " "	twelve do.,	15 00

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Philadelphia, - - - Messrs. Colon & Adriance.
Boston, - - - - Jordon & Wiley.

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Lap-welded Wrought Iron Tubes

FOR TUBULAR BOILERS,

From 1 1-4 to 6 inches diameter, and any length, not exceeding 17 feet.

THESE Tubes are of the same quality and manufacture as those extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER, Patentee,
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C. HAMMOND, Principal.
Monson, Mass., Nov. 14, 1846. n28

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Engraving on Wood

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CURIOUS ARTS

On Artificial Ultramarine.

Till within the last twelve or fifteen years the only source of this beautiful pigment was the rare mineral, *lapis lazuli*. The price of the finest ultramarine was then so high as 5 guineas the ounce. Since the mode of making it artificially has been discovered, however, its price has fallen to a few shillings the ounce. Artificial ultramarine is now manufactured to a considerable extent on the Continent, but as far as I can learn, none has yet been made in Great Britain. The chief French manufactories of ultramarine are situated in Paris; and the two largest ones in Germany are those of Messein in Saxony, and of Nuremberg in Franconia. Three kinds of ultramarine occur in commerce, the blue, the green, and the yellow. The first two are the only true ultramarines, that is, sulphur compounds: the yellow is merely the chromate of baryta.

Both native and artificial ultramarine have been examined very carefully by several eminent chemists, who, however, have been unable to throw much light upon their true nature. Chemists have undoubtedly ascertained that ultramarine always consists of silica, alumina, soda, sulphur, and a little oxide of iron; but no two specimens, either of the native or artificial ultramarine, contain these ingredients in at all similar proportions. In fact, the discrepancies between the analyses are so great as to render it impossible to deduce from them any formula for the constitution of ultramarine; if indeed it does possess any definite composition. The following are a few specimens of these analyses, and others equally discordant might easily be added.

Lapis Lazuli. *By Clement and Desormes.*		*Lapis Lazuli.* *By Varentrap.*	
Soda	23.2		9.09
Alumnia	24.8		31.67
Silica	35.8		45.50
Sulphur	3.1		0.95
Carbonate lime	3.1	Lime	3.52
		Iron	0.86
		Chlorine	0.42
		Sulp. Ac.	5.89
		Water	0.12

Artificial Ultramarine. Parisian. *By C. G. Gmelin.*		*Art. Ultramarine. Meissen.* *By Varentrap.*
Soda and Potash	12.863	21.47
Lime	1.546	1.75
Alumin.	22 000	0.02
Silica	47.306	23.30
Sulphuric Acid	4.679	45.00
Resin, Sul. & Loss	12.218	3.83
Iron		1.063

The last chemist who has examined ultramarine is Dr. Elsner, who has published a very elaborate paper upon it in the 23d number of Erdmann's Journal for 1841. The first part of Dr. Elsner's paper is historical, and contains an account of the accidental discovery of artificial ultramarine by Tassart and Kuhlman in 1814, and of the labors of subsequent chemists. He then gives a detailed account of his own experiments, which have been very numerous, and from these he deduces the following conclusions: 1st, That the presence of about one per cent. of iron indispensable to the production of ultramarine he supposes the iron to be in a state of sulphuret. 2d. That the green ultramine is first formed, and that as the heat is increased it passes by degrees into the blue. The cause of this change is, he affirms, that part of the sodium absorbs oxygen from the atmosphere, as the operation is conducted in only partially closed vessels and combines with the silica, while the rest of the sodium passes into a higher degree of sulphurization. Green ultramarine, therefore, contains simple sulphurets, and blue, polysulphurets.

Dr. Elsner's paper does not, however, furnish any details by which ultramarine could be manufactured successfully on the great scale. Thus, for example, in regard to the necessary degree of heat, perhaps the most important circumstance in the process, he gives no directions whatever. We know, however, from other sources, that it should be a low red heat, as at much higher temperatnres both native and artificial ultramarine soon become colorless. Dr. Elsner, indeed does not affirm that he was able to procure ultramarine in quantity of a uniform color. In fact, the process of Robiquet, published nearly ten years ago, is the best which scientific chemists possess, though undoubtedly, the manufacturers have greatly improved upon it. Robiquet's process consists in heating to low redness a mixture of one part porcelain clay, one and a half sulphur, and one and a half parts anhydrous carbonate of soda, either in an earthenware retort or covered crucible, so long as vapors are given off. When opened the crucible usually contains a spongy mass of a deep blue color, containing more or less ultramarine mixed with the excess of sulphur employed, and some unaltered clay and soda. The soluble matter is removed by washing, and the ultramarine separated from the other impurities by levigation. It is to be regretted, however, that the results of Robiquet's process are by no means uniform: one time it yields a good deal of ultramarine of excellent quality, and perhaps, at the very next repetition of the process in circumstances apparently similar, very little ultramarine is obtained, and that of an inferior quality.

The fabrication of ultramarine is a subject which well deserves the attention of English chemical manufacturers, as it could be carried on with peculiar advantage in this country.—The chief expense of the process is the fuel required, which can be purchased in Great Britain for less than half the money it would cost in France or Germany.—*Lon. Mec. Mag.*

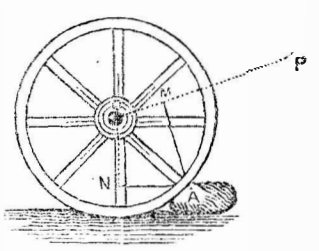
Cast Jewelry.

At the last exhibition at Vienna of metallurgic industry in Austria, the productions of M. Glanz, who had been attached for 15 years to the Royal Foundry at that capital, created general admiration. His art consists chiefly in producing cast jewelry, of a most surprising delicacy. They are cast in moulds formed of very fine sand—the patterns are in bronze, and worked with great care. The cast metal which is used, will have a great influence on the success of this operation. That which is chiefly employed at Vienna, is obtained from Maria-Zell in Styria—or from the royal foundry in the environs of Halle, in the Tyrol; it is a grey metal, very compact and homogenous. This metal is put in fusion in crucibles of plombagine, (lead and silver ore mixed together); it is run into moulds so well made that every portion comes out most perfect. The additions required to be made are, by rendering them ductile with powdered charcoal in a red heat for several hours, and afterwards finished by filing. This metal, becoming malleable, can be finely polished; but it is often washed with a black varnish, and then baked in an oven. These are chiefly used for mourning jewelry. M. Glanz is not confined by the same process to casting brass trinkets, but gold and silver, and other metals, by which he saves all the trouble of the chaser. The collection is very varied—bronze figures, broaches, bracelets, necklaces, snaps, buckles. buttons, scissors, &c. This jewelry is better known under the name of Berlin, and an immense quantity is annually imported into England and France, which being at so reasonable a price, has nearly superseded the Birmingham ware, and the manufactures of France where they experience so much difficulty in obtaining the proper description of metal and fuel, and that at a very high price, so as to preclude them from competing with those of Vienna, Berlin and other parts of Germany, where the art in the improvement of metal has made great progress.

Clarke and Varley's Atmospheric System.

The peculiarities of this system consist in making the tube of sheet iron, wrought into the circular form. The two edges are not joined permanently together, but provided with tips about one inch and a half in height, and to one of which a piece of leather, India rubber or some other elastic substance is attached, so that when the two lips are pressed together, as they naturally are when not kept apart by the connecting rod, a joint is formed which is perfectly air tight, without any composition being used. At intervals along the tube are powerful springs, to exert a great pressure upon its lips.

Resistance to Carriage Wheels.



There are probably, but very few people, even among those engaged in carting, who are aware of the immense draught required in a horizontal direction to raise the wheels of a cart or carriage over an obstacle in the road. The following illustration of the subject, which is evidently correct, we copy from Olmstead's Compendium of Natural Philosopoy.

Thus let A be an obstacle, as a stone for example. From A let fall the perpendiculars AN, AM, upon CR, CP, and conceive MAN to be a bent lever, turning on A as a fulcrum, the power being applied at M in the direction CP, and the weight resting on N (which supports the centre of gravity.) Now, the mechanical advantage gained, will be in the ratio of MA to NA. It will therefore be increased (and of course the force necessary to overcome the obstacle be diminished) as the point A is nearer to R; and the mechanical advantage will be lessened as the point A recedes from R. When the obstacle is so large as to make AM equal to AN, then no mechanical advantage is gained, but the whole weight of the load must be lifted by the former; and when AM becomes less than AN, the wheel involves a mechanical disadvantage, and the difficulty of carrying the wheel over the obstacle becomes very great. It is farther obvious that *large wheels* have the mechanical advantage, both as regards overcoming the friction, and overcoming obstacles, in a higher degree than small wheels, since these afford a greater leverage than the others on account of the increased length of the spokes. But in practice very large wheels cannot be employed since they would be either too weak or too heavy, and the increased height of the axle would carry the centre of gravity too high, and enhance the danger of upsetting. The difficulty of turning might also render unusually large wheels ineligible; and the axle might be raised so high, as to make a horse draw obliquely downwards and increase the pressure on the ground, whereas the line of draught ought to be so adjusted as to lighten tha pressure, especially where the road is soft and yielding.

Removal of Stains from Books.

A solution of oxalic acid, citric acid or tartaric acid may be applied without fear of damage. These acids taking out writing ink, and not touching the printing, can be used where the margins have been written upon, without attacking the text. When the paper is disfigured with stains of iron, it may be restored by applying a solution of sulphuret of potash, and afterwards one of oxalic acid. The sulphuret extracts from the iron part of its oxygen, and renders it soluble in diluted acids.—The most simple, and effectual method of erasing spots of grease, wax, or oil, is by washing the part with ether, and placing it between white blotting paper. Then with a hot iron press above the part stained, and the defect will be speedily removed. In many cases, where the stains are not bad, rectified spirits of wine will be found to answer the purpose.

New Solder.

Dissolve zinc in muriatic acid to saturation; add powdered sal ammoniac to this solution, and after boiling it for a short time, it is ready for use. Into this compound, no cleaning of the metal is necessary, however oxidized, and oil and other materials are dispensed with. It is only necessary to apply the compound with a piece of sponge upon a stick or a feather to the part which is to be soldered, in place of the article now used, to prevent oxidation, and facilitate the flow of the solder. Such is the efficacy, that if two pieces of bar, possessing considersble surface, be wet with this solution and pressed together, upon the application of the soldering tool the solder will at once flow between the plates through-out

Latent Caloric.

If a flat bar of iron be hammered briskly on an anvil, its temperature will soon be so increased, that a piece of phosphorous laid upon it would be instantly inflamed. This experiment is designed to show that caloric may be evolved merely by percussion; and that, when evolved, it is as active and energetic as though it had never been latent.

This heat is probably produced from electricity which pervades the iron, rather than from the metal itself.

New mode of growing Potatoes.

A case is reported of a gentleman who having occasion to prune a vine, stuck half of a potato on the stump of the branch, and bound a piece of cloth over it to preserve it from the weather. On examining the cloth a few months afterwards he was surprised to find a number ot new potatoes grown from the piece thus enclosed.

The Way the World Wags.

A cotemporary moralizes on the fact, or *very probable* case, that an ignorant negro who had never been allowed to read or to be taught that he had a soul, is tempted and encouraged to drink by a man who gets rich by selling rum, and in a state of intoxication the negro kills a man. The rumseller is the first to arrest him and deliver him to the jailor who is also a rumseller, and he is brought before a judge who never would have been elected, if he had not got wealthy by selling liquors.—The negro is hung of course, for getting drunk—while those who made him so for their own interest, get pay for the process of arresting, judging, and hanging him, and are highly respected by the public.

THE NEW YORK

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Published Weekly at 128 *Fulton Street., (Sun Building,) New York.*

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